

Plan Explorer Index Analysis

Last Modified on 15 July 2021

Introduction

The Plan Explorer **Index Analysis** tab provides a sandbox environment for planning indexing strategy relative to a specific operation in a query.

For **Index Analysis** to populate, the query must execute from within the Plan Explorer session, using the **Get Actual Plan** menu option.

[Additional Information](#): See the [SQL Sentry Index Analysis](#) blog post for more details and examples.

The screenshot displays the Index Analysis interface in Plan Explorer. At the top, a 'Command Text' tab shows the SQL query being analyzed. Below it, a table lists the execution statistics for various statements, including CPU usage, duration, and row counts. The main section is the 'Index Analysis' tab, which shows a table of index statistics for the query. The table includes columns for 'Table Column', 'Density', 'Last Statistics Update', 'Update Statistics', 'Avg Length', 'Estimate Size (MB)', 'Output', 'Sort Type', 'Sort Order', 'Predicate', and 'Index Statistics'. The 'Index Statistics' column is expanded to show details for each index, including 'PK_Sales_OrderLines (Clustered)', 'IX_Sales_OrderL...', 'Missing Index I', 'NCCX_Sales_OrderLines (Columnstore)', 'IX_Sales_OrderLines_P...', 'IX_Sales_OrderLines_A...', and 'FK_Sales...'. The 'Total Score' row shows a score of 16% for the clustered index, 69% for the IX index, 90% for the missing index, 0% for the columnstore index, 59% for the IX index, and 37% for the FK index. Below the table, a 'Parameters' section shows the values for '@EndTime' and '@StartTime'. A 'Statistics Histogram' for the 'IX_Sales_OrderLines_Perf_20160301_01 (PickingCompletedWhen)' index is displayed, showing a distribution of values over time. The histogram shows a peak in activity around 2014-01-15, with values reaching up to 10,000. The x-axis represents time from 2013-04-26 to 2020-04-28, and the y-axis represents the number of rows, ranging from 0 to 10,000. The histogram also shows a red dashed line indicating a tipping point range.

Overall view of the Index Analysis tab in a Plan Explorer session

The Statement Tree and Plan Diagram

For more information, see the [Integrated Plan Explorer](#) topic.

The Text Data Area

For more information, see the [Integrated Plan Explorer](#) topic.

The Indexes Data Grid

Table Column	Update Statistics	Avg Length	Estimate Size (MB)	Output	Sort Type	Sort Order	Predicate	PK_Sales_OrderLines (Clustered)	IX_Sales_OrderL...	Missing Index ?	NCCI_Sales_OrderLines (Columnstore)	IX_Sales_OrderLines_P...	IX_Sales_OrderLines_A...	PK_Sales_OrderLines_...	PK_Sales_OrderLines_...
Total Score								16%	69%	90%	0%	59%	37%	26%	16%
PickingCompletedWhen	<input type="checkbox"/>	7.0	3.9	<input checked="" type="checkbox"/>			[WideWorldImporters].[Sal...	4	1			2			
OrderID	<input type="checkbox"/>	4.0	2.0	<input checked="" type="checkbox"/>				Data	2	Included	Included	Included		1	
OrderLineID	<input type="checkbox"/>	4.0	2.0	<input checked="" type="checkbox"/>			[WideWorldImporters].[Sal...	1	3			Included	Included		Included
Quantity	<input type="checkbox"/>	4.0	2.0	<input checked="" type="checkbox"/>				Data	Included	Included	Included				
StockItemID	<input type="checkbox"/>	4.0	2.0	<input checked="" type="checkbox"/>				Data	Included	Included	Included	1	1		
Description	<input type="checkbox"/>		99.9	<input type="checkbox"/>				Data			Included				
PackageTypeID	<input type="checkbox"/>	4.0	2.0	<input type="checkbox"/>				Data							1
PickedQuantity	<input type="checkbox"/>		2.0	<input checked="" type="checkbox"/>				Data		Included	Included	Included	Included		
UnitPrice	<input type="checkbox"/>		4.5	<input checked="" type="checkbox"/>				Data		Included	Included				
Last Statistics Update								2020-04-29 09:45:19.417	2020-04-29 09:45:19.977			2020-04-29 09:45:20.180	2020-04-29 09:45:19.823	2020-04-29 09:45:19.510	2020-04-29 09:45:19.670
Estimated Size (MB)								81.6	22.1		36.3	20.8	11.8	7.2	7.2
Scripting Options	<input type="checkbox"/>							<S> aLi	<S> aLi	<S> aLi	<S> aLi	<S> aLi	<S> aLi	<S> aLi	<S> aLi

The top row is the index **Total Score** that's based on several factors including covering, value density, sorting effectiveness, and seek-ability. 100 percent is the best possible score; however, there are some situations that prevent the possibility of a 100 percent score. One known cause is when columns are missing statistics.

Column statistics are provided for each table column used by the query, with table columns used by the selected operation displayed in bold.

Data Grid Columns:

Name	Description
Table Column	Name of the column in the relevant database table.
Last Statistics Update	The date the column statistics were last updated.
Update Statistics	Automatically updates the existing statistics.
Avg. Length	Average length of data values.
Estimated Size (MB)	The estimated size of the column values (in MB).
Output	Checked if the column is an output for the selected operation.
Sort Type	Sort order (ASC, DESC).
Sort Order	Ordinal position of the column in the sort.
Predicate	The search or join predicate(s) applied to the table column by the operation.

Columns in the grid to the right of the **Predicate** column all represent indexes. These include both special case indexes, as well as the indexes defined on the table.

Indexes can be modified, as well as scripted for **create**, **drop**, or **drop and create**. Manually update statistics using the button at the bottom of the index column.

Index Coloring:

- Shades of green indicate that the ordinal position of the column is such that a favorable operation may occur, such as a seek over a scan. Darker shades of green indicate that the column is filtered.

- Yellow indicates that the column is used in the query, and covered, but isn't part of the left subset of the index key. Included columns are also listed in yellow.
- Red indicates that the column involved isn't covered by the index.

The Parameters Data Grid

The parameters grid lists parameters used by the query. This differs from the **Plan Explorer Parameters** tab in that it uses tipping point logic to help determine the type of operation (**Seek** or **Scan**) that the optimizer might choose for that parameter value. This isn't an exact science, and should be used as a rough guideline.

The parameters grid provides a **Test Value** column that allows you to enter a new parameter value and asks for a new **Estimated Plan**. This allows you to test different parameter values against the plan to see if the plan shape changes given that parameter value.

The small arrows to the right of the parameter values allow you to quickly place the value of that parameter into the **Test Values** column.

Parameter	Compiled Value	Runtime Value	Test Value
[@EndTime]	'2014-01-22 00:00:...' ▶	'2014-04-11 00:00:...' ▶	
[@StartTime]	'2014-01-15 00:00:...' ▶	'2014-03-15 00:00:...' ▶	
Total Rows	1,468	4,286	
Est Operation	SEEK	SCAN	
		Get Est Plan	Get Est Plan

Tipping Point Range
 Est/Actual Rows
 Range Rows
 Avg Range Rows

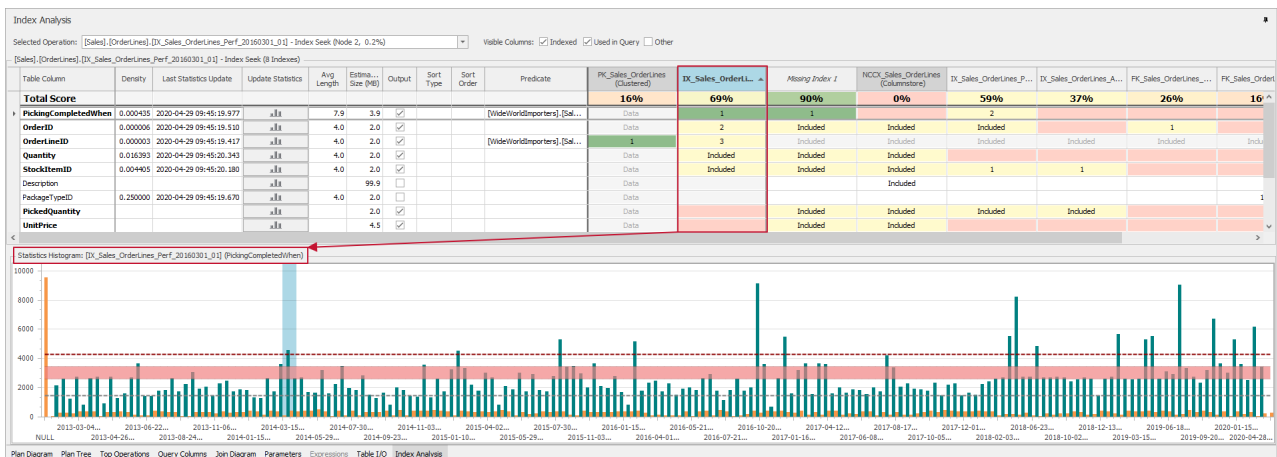
Options for Parameters Data Grid

Option	Description
Tipping Point Range	Select this box to display the tipping point range on the histogram chart. <input checked="" type="checkbox"/> Additional Information: Blog posts from Kimberly Tripp on the tipping point.
Est/Actual Rows	Select this box to show estimated and actual rows on the histogram chart.
Range Rows	Toggle this switch to Range Rows to display the total range rows on the histogram chart. Note: Total range rows can be helpful for visualizing range predicates.
Avg Range Rows	Toggle this switch to Avg Range Rows to display the average range rows on the histogram chart. Note: Average range rows can be helpful for when working with equality

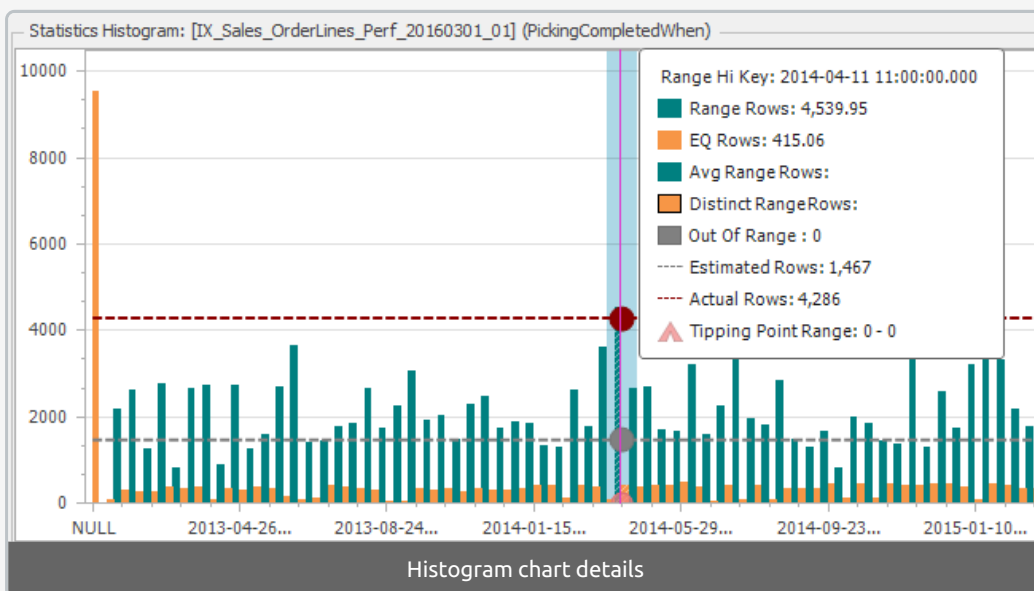
The Statistics Histogram Chart

The **Histogram** chart displays the histogram steps for the index statistics visually. This allows you to quickly spot potential parameter sniffing issues.

This chart also works in conjunction with the parameters grid, and selected parameters that are present in the histogram have their histogram buckets highlighted on the chart. This also works for parameter ranges.

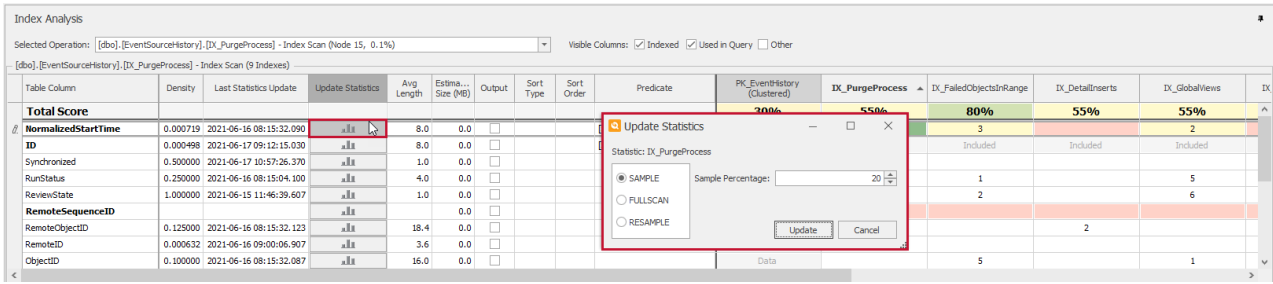



Note: Hover over the histogram to view more details.

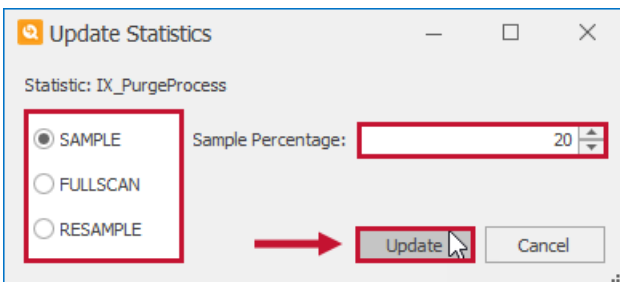


Note: For more information about Index Analysis, see the [Sentry v10 : Index Analysis](#) blog post.

Update Statistics



Update the statistics for a selected index on the Index Analysis tab by selecting the Update Statistics button  . On the **Update Statistics window**, select the sample mode, select a sample percentage, and then select **Update** to refresh the index statistics.



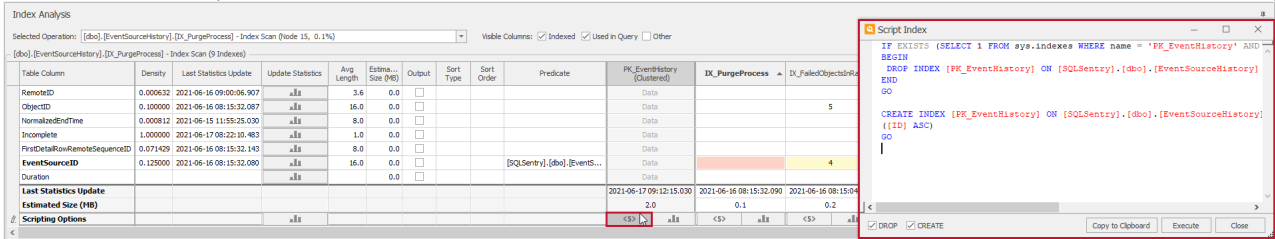
Note: The **Sample percentage** for an index is set to 20 percent by default.

Update Statistics Window

Option	Description						
Statistic	The selected index statistic that you want to update.						
Statistic mode	<table border="1"> <tr> <td>SAMPLE</td> <td>Scans a sample of the selected index based on the desired sample percentage.</td> </tr> <tr> <td>FULLSCAN</td> <td>Scans the entire selected index.</td> </tr> <tr> <td>RESAMPLE</td> <td>Resamples the selected index.</td> </tr> </table>	SAMPLE	Scans a sample of the selected index based on the desired sample percentage.	FULLSCAN	Scans the entire selected index.	RESAMPLE	Resamples the selected index.
	SAMPLE	Scans a sample of the selected index based on the desired sample percentage.					
	FULLSCAN	Scans the entire selected index.					
RESAMPLE	Resamples the selected index.						
Sample Percentage	This option is only available if you select the SAMPLE scan mode option. Scans the entered percentage of the index.						
Update	Updates the statistics based off of your selections.						
Cancel	Closes the Update Statistics window.						

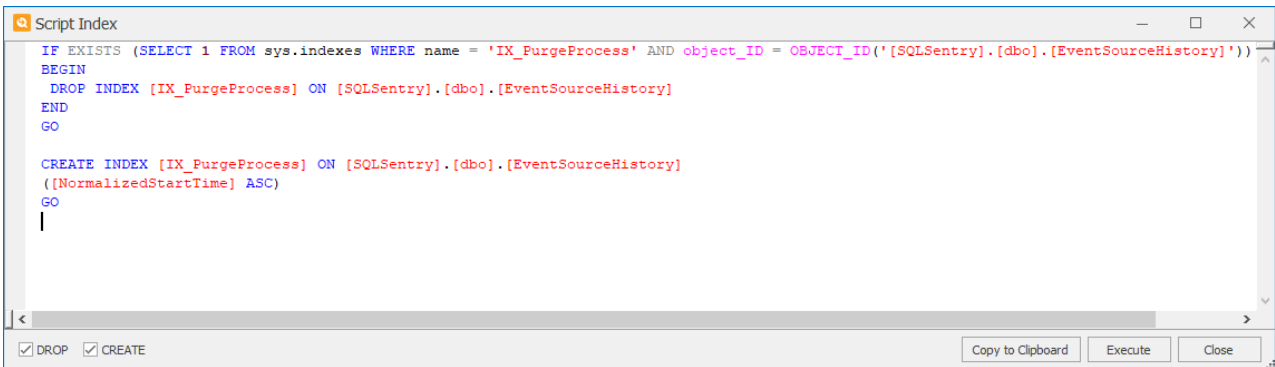
Script Index

Description



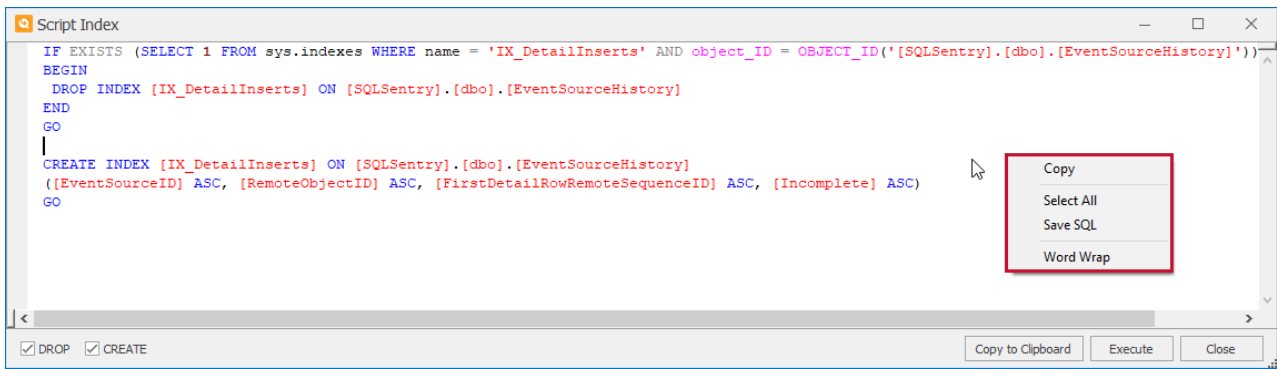
View the associated script for a selected index by selecting the Script Index button  .

Script Index Window



Option	Description
Script Editor	View and make edits to the script for the selected index in the script editor view.
Drop checkbox	Displays the Drop index statement when selected. Removes the Drop index statement when deselected.
Create checkbox	Displays the Create index statement when selected. Removes the Create index statement when deselected.
Copy to Clipboard	Copies the entire index script to the clipboard.
Execute	Executes the index script.
Close	Close the Script Index window.

Script Index Window Context Menu



Context menu option	Description
Copy	Copies the selected text from the Script editor.
Select All	Highlights all of the text in the Script editor.
Save SQL	Saves the script as a .sql file.
Word Wrap	Displays the script using word wrap to minimize horizontal scrolling.